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EXAMINER	
SCHECHTER, ANDREW M	
ART UNIT	PAPER NUMBER
2871	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/603,990	NAM ET AL.	
	Examiner	Art Unit	
	ANDREW SCHECHTER	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,8-15 and 17-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,8-15 and 17-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 14 July 2008 have been fully considered but they are not persuasive. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

The applicant has amended claims 1, 10, 12, 19, and 21 to recite that the TFT includes a gate electrode, an active layer, and source and drain electrodes. The claims also recite the reflective layer "substantially" not overlapping the TFT. The applicant's disclosed invention [see Fig. 6] has the reflective layer not overlapping the gate electrode, active layer, and source and drain electrodes at all, but this is not what is presently claimed.

The applicant argues [p. 12, first full paragraph] that *Mitsui* teaches the reflection electrode overlapping the TFT, specifically a part of the drain electrode. To the extent that the applicant is defining the entire drain electrode metal layer to be part of the TFT (this definition is not universal: the metal layer of the drain electrode often extends quite far from the semiconductor channel region; sometimes the entire metal layer is called the drain electrode and sometimes just the part near the channel region is called the drain electrode; the definition would be awkward, for instance, when the drain electrode and pixel electrode were formed of the same layer, so that the pixel electrode were merely part of the drain electrode), the examiner would agree that *Mitsui's* reflective layer does overlap the TFT, so defined. The applicant then concludes that *Mitsui* "never

teaches the reflection layer substantially [not] overlapping the thin film transistor of the claimed invention" [sic]. (The examiner assumes that the applicant meant "substantially not overlapping" in this sentence.) This is not persuasive. The key word in the claim is "substantially". As seen from Fig. 6 of *Mitsui*, the reflective electrode overlaps only a small portion of the TFT and does not overlap any of the critical channel region between the source and drain electrodes, which is the part that makes the TFT act as a TFT. This is not incidental but intentional, as *Mitsui* explicitly teaches negative consequences attending such an overlap [col. 3, lines 32-45]. Given the semantic question regarding the extent of the drain electrode (discussed above), *Mitsui's* explicit teaching that the reflective electrode should not overlap the TFT's channel region, and the lack of discussion in the specification regarding the phrase "substantially not overlapping", the examiner holds that *Mitsui* does indeed teach having the reflective layer "substantially" not overlapping the TFT. The previous rejections are therefore maintained, modified as necessary by the amendments to the claims.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 10, 12, 13, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kubota, et al.,* US 2002/0171792 in view of *Mitsui et al.,* U.S. Patent

No. 5,408,345, in view of *Maeda et al.,* U.S. Patent No. 7,123,325 and further in view of official notice/admitted prior art.

Kubota discloses [see Fig. 1, for instance] a transflective liquid crystal display device comprising a substrate [2] having a reflective portion and a transmissive portion, a gate line [14a] on the substrate, a data line [17], a thin film transistor [14] connected to the gate line and the data line, and including a gate electrode [14a], an active layer [12], and source and drain electrodes [14b, 14c]; an insulating layer [19] having an open portion at the transmissive portion, a reflective layer [20] on the insulating layer having a transmissive hole at the open portion, a pixel electrode [3] on the reflective layer, an opposing substrate [5] facing the substrate, and a common electrode [6] on an inner surface of the opposing substrate, the common electrode being substantially flat.

Kubota possibly does not explicitly disclose that the gate and data lines cross to form a pixel region; the examiner takes official notice that this was well-known in the art at the time of the invention [as this was not traversed by the applicant, this is considered admitted prior art; see MPEP 2144.03]. It would have been obvious to one of ordinary skill in the art at the time of the invention to have it so, motivated by the desire to form the standard active matrix of pixels for the display.

Kubota does not disclose the reflective layer substantially not overlapping the thin film transistor. However, *Mitsui* discloses [see Fig. 5] an analogous device having the analogous reflective layer [38] substantially not overlapping the thin film transistor [40], and teaches doing so [col. 3, lines 32-45], saying that when the reflective layer does overlap the TFT, the signal applied to the reflective layer can spuriously act as a

gate electrode, causing the TFT to malfunction, and can produce an undesirable parasitic capacitance between the reflective layer and the gate electrode. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the reflective layer substantially not overlapping the TFT, motivated by the desire to avoid such electrical problems as taught by *Mitsui*.

Kubota does not disclose that the insulating layer [19] has a plurality of uneven patterns consisting of a first organic material layer within the reflective portion, the uneven patterns partially covering the substrate, and a second organic material layer on the first organic material layer. *Maeda* [see Fig. 10K, for instance] discloses an analogous transflective LCD in which the insulating layer under the reflective layer and pixel electrode has a plurality of uneven patterns consisting of a first organic material layer [51] within the reflective portion, the uneven patterns partially covering the substrate, and a second organic material layer [52] on the first organic material layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to have it be so, motivated by the desire to make the surface of the reflective layer bumpy, so that the light diffusively reflects off the surface (rather than reflecting like a mirror), thus improving the display quality. Claim 1 is therefore unpatentable.

Considering the additional limitations of claim 10, *Kubota* also discloses a liquid crystal layer between the pixel electrode, wherein the pixel electrode and the common electrode are separated by a first cell gap in the transmissive portion, and a second cell gap in the reflective portion, and the first cell gap is twice greater than the second cell gap [see paragraph 0084, for instance]. Claim 10 is therefore unpatentable as well.

Considering the additional limitations of claims 12 and 19, *Kubota* in view of *Maeda* also discloses the method of fabricating the above LCD, except perhaps for the step of performing an exposure and development process on the first and second photosensitive organic material layers. *Maeda* discloses using organic layers which are photosensitive, but does not necessarily disclose the particular patterning steps recited. The examiner takes official notice that for patterning such organic layers, performing an exposure and development process on organic layers was well known [as this was not traversed by the applicant, this is considered admitted prior art; see MPEP 2144.03]. It would have been obvious to one of ordinary skill in the art at the time of the invention to do so, motivated by this being the standard technique for patterning organic materials in the art. Claims 12 and 19 are therefore unpatentable as well.

The first and second organic material layers are formed from a photosensitive material, including comprising a photo-acrylic resin [see *Maeda,* col. 13, lines 29-35, for instance], so claims 2 and 3 are also unpatentable. Considering claim 13, it would have been "obvious to try" a photo-acrylic resin for both the first and second photosensitive material layers, with predictable results, as this type of material is routinely used in forming such organic layers, as evidenced by *Maeda* above, so claim 13 is also unpatentable.

4. Claims 4, 5, 14, 15, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kubota, et al.,* US 2002/0171792, *Mitsui et al.,* U.S. Patent No. 5,408,345, *Maeda et al.,* U.S. Patent No. 7,123,325, and official notice/admitted prior art as applied above, and further in view of *You,* U.S. Patent No. 7,023,508.

Kubota discloses an insulating layer [18] covering the gate line, the data line, and the thin film transistor, but does not state that it is inorganic. *You* discloses an analogous device [see Fig. 3, for instance], which has an inorganic material layer [116] made of silicon nitride, covering the gate line, the data line, and the thin film transistor. It would have been obvious to one of ordinary skill in the art at the time of the invention to use an inorganic layer, such as *You's* silicon nitride, in the above device, motivated by *You's* teaching that this maintains the reliability of the transistor and pads and enhances the strength of COG bonding [col. 9, lines 1-8]. Claims 4, 5, 14, 15, and 21 are therefore unpatentable.

5. Claims 8, 9, 11, 17, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kubota, et al.,* US 2002/0171792, *Mitsui et al.,* U.S. Patent No. 5,408,345, *Maeda et al.,* U.S. Patent No. 7,123,325, and official notice/admitted prior art as applied above, in view of official notice.

Kubota does not necessarily disclose gate pads, data pads, or a capacitor electrode overlapping the gate line. The examiner takes official notice that these features are well-known and conventional in the art [as this was not traversed by the applicant, this is considered admitted prior art; see MPEP 2144.03]. It would have been obvious to one of ordinary skill in the art at the time of the invention to include them in the above device, motivated by the desire to make electrical contact to the gate and data lines, and to provide a reliable storage capacitance to improve the display quality. Claims 8 and 17 are therefore unpatentable.

Similarly, to make electrical contact to these, it is necessary to have drain contact holes, capacitor contact holes, gate pad contact holes, and data pad contact holes as recited; the examiner takes official notice that such are well-known [as this was not traversed by the applicant, this is considered admitted prior art; see MPEP 2144.03] and would have been obvious to one of ordinary skill in the art at the time of the invention, for the purpose of making electrical contact to the relevant electrodes through the second organic material layer. Claims 9 and 18 are therefore unpatentable.

The difference in cell gaps is provided by the height of the insulating film, and for the first (transmissive) cell gap to be twice the second (reflective) cell gap, the height needs to be equal to the second cell gap. The uneven patterns are equal to or less than this height, so they have a height equal to or less than the second cell gap, as required by claims 11 and 20. Claims 11 and 20 are therefore unpatentable. Even were this not true, adjusting the height of the uneven patterns to improve the reflective properties of the reflective layer, or to optimize the relative cell gaps for better liquid crystal behavior, would have been obvious to one of ordinary skill in the art at the time of the invention, motivated by the desire to optimize these features of the device, so claims 11 and 20 are unpatentable.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew Schechter/
Primary Examiner, Art Unit 2871
Technology Center 2800
31 October 2008